FINAL REPORT

DIGEST OF PUBLIC WORKSHOPS FALL RIVER NAVIGATION IMPROVEMENT PROJECT JULY 14 AND 15, 1981

1981

US Army Corps of Engineers
New England Division

FINAL REPORT

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I. Overview

Public Workshops for the purposes of scoping an EIS for the proposed Fall River Navigation Improvement Project were held in Fall River, Massachusetts on July 14, 1981 (P.M./No. 1; Eve./No. 2) and July 15, 1981 in Jamestown, Rhode Island (Eve./No. 3) by BEC, Inc. for the COE. Private and public interests were well represented and through significant dialogue between the general audience, the panelists, and COE fact persons, important information was brought forward which will ultimately affect the direction of the DEIS to be prepared. The following account thus represents a digest of ideas formulated and exchanged by the general audience, 8 panelists in Workshop No. 1, 6 in Workshop No. 2, and 9 in Workshop No. 3, concerning engineering/environmental, legal/administrative, and socio/economic aspects of the Fall River Improvement Project.

With regard to the physical/chemical characteristics and environmental effects of the dredged materials, it seemed to be the general feeling that they were "relatively clean" material whose major environmental effects would be a physical inundation of the disposal area. The magnitude of the effect was considered to be primarily dependent upon how well the dredged material characteristics matched existing bottom disposal site conditions. Reservations concerning the "cleanliness" of the dredged materials and their potential

effects were voiced by the FWS and others with regard to bioassay results based upon sample compositing over a 5 foot depth, and a lack of toxic scan for priority pollutants in bottom sediments and animal tissue.

Upland disposal of dredge spoils was virtually eliminated from further consideration due to the lack of appropriate and available sites. Land disposal is viable only when there is a site available and the environmental and socio-economic impacts are acceptable. There does not have to be a productive use (although this is usually preferred) nor do shallow water or open water sites first have to be determined unsuitable. Lack of identification of land sites with potential for disposal caused a general consensus to be reached against upland disposal options. The FWS still requested that several sites suggested by NERBC and subsequently eliminated by the COE and others be re-examined.

Shallow water disposal into Mt. Hope Bay was considered worthy of further study with significant interest placed upon an expansion of the present Spar Island using varying degrees of containment. There was also a lengthy discussion and interest in various COE/State/private interest cooperative agreements to place dredged material in several discrete bulkheaded containment areas along the Fall River waterfront. Aside from obvious environmental issues, there seemed to be potential problems with ownership, riparian rights, funding, and cost effectiveness of pumping into scattered shallow water sites. As well as the fact that only a portion of the total amount of material to be dredged could be accommodated in the sites discussed.

Concern was expressed regarding the geotechnical suitability of the dredged materials for the creation of industrial/commercial land.

Open Water Disposal met with significant opposition, especially from Rhode Island fishery interests who were concerned with despoilment of Rhode Island fisheries by dredge materials of largely Massachusetts origins. It appeared as though virtually no open water sites could be identified which were not fished by some interests. Instances of past adverse effects to fisheries by careless dredge material disposal were noted and served to kindle mistrust by fishermen towards the use of open water disposal site, despite some testimony from several people that potentially acceptable open water sites were available, and that the recovery of fisheries at these sites could be expected in time. It was pointed out the potential adverse effects should be analyzed as an economic cost to the fishing industry.

Concern was expressed by the fishing interests that once a site was opened up for this project it would be the most likely candidate for use on future projects, including those with polluted sediments. This consideration was reinforced by the pending EPA open water disposal regulations which will favor "existing" sites.

It was mutually agreed that a environmentally suitable, deep water, contained regional disposal site was needed to serve all southern New England waters. It also appeared that the continuing clash between fishery and harbor industry

interests, as well as political rivalries, would make the delineation of such a site extremely difficult.

In retrospect, it appears that the future of Fall River harbor commerce and the Mt. Hope Bay/Block Island Sound fisheries is dependent upon realistic compromise between competing yet potentially compatible interests. Moreover, the panelists seemed to focus upon the need to look very seriously upon alternate bulkheaded disposal options to reclaim land, however poor the sediments geotechnical characteristics and difficult the legal, administrative, and cost aspects.

II. Dredged Material Characteristics and Effects

In general, the results reported by the COE for bulk sediment properties, chemistry, and toxicant extraction were accepted. No significant rebuttal to the test results was presented, thus the conclusion that the dredged material is "relatively clean" seems reasonable at this time.

The bioassay and biotoxicity data were, however questioned, especially by V. Lang (FWS) because of compositing through a 5' sediment column which he equated to dilution, and the failure of the COE to look for toxic contaminants (129 priority pollutants) in bottom sediments and fish tissues. Lang also noted that freezing of tissue arrests bacterial action which R. Pond of Stripers Unlimited thought was instrumental in activating toxins in mesenteric tissue of fish (i.e. PCB uptake). Engler (WES) cited significant data to refute the bacterial decomposition/toxic uptake theory. He also brought out the fact aquaria studies for bioassay/biocumulation studies were done at higher than insitu temperatures which would elevate bacterial action.

Capt. Verber of the USPHS/FDA indicated that the majority of harbor dredge sediments were bacterially unacceptable and that bacterial problems could be transported to disposal sites and result in significant impacts to shellfish grounds. He indicated that the USPHS will collect (7/16/81) ten samples from the Fall River channel for bacterial analysis.

S. Pratt (URI) indicated that dredging a channel to the 35-40' depth some 15-20' below the surrounding bay floor causes

the channel to act as a fine sediment sink which precludes shellfish from its soupy environs. Pratt also noted historical dumpings of mercury and PCB's into Mt. Hope Bay and thought uptake in shellfish throughout the bay should be investigated in the event these contaminants did not stay in the sediments and began to accumulate in shellfish stocks. Some fishermen wondered about dredged induced turbidity and pollutant uptake by organisms, but Engler (WES) stated that such turbidity was usually limited to within a few hundred yards of the dredged channel and released insignificant pollutants (elutriate test).

Valid, potentially limiting disposal effects were noted by Engler (WES) who indicated that the degree of long-term environmental impact at the disposal site was dependent upon how closely the dredged material characteristics matched existing conditions at the disposal site. Engler and Pratt (URI) also noted that the major effects of dredge material dumping are primarily physical overwhelming of the existing site and subsequent burial of organisms. Pratt noted that burial of fishing grounds by dredge spoils has historically led to cessation of trawling and subsequent recolonization by lobsters. Capt. Verber (PHS/FDA) and L. McCavitt (Mass. CZM both favored using containment sites that had been used before, especially if the material is clean. F. Manchester (Manchester Fisheries) presented evidence that dump site topography could be a critical factor in determining the degree of adverse impact to the trapping of migratory fish. Finally, V. Bell (R.I. DEM) agreed that the dredged materials could not be

viewed as "hazardous" but still created impacts, the seriousness of which L. Staskiukiewicz (Point Judith Fish Coop) argued should be represented in the cost/benefit analysis as an economical loss to the fishing industry.

III. Upland Disposal

A field review of the NERBC disposal site study by the COE indicated that only site 27, owned by Montaup Electric and previously a dredged material site was potentially acceptable for upland disposal. Other sites were too far away, too high, too valuable in alternative land uses, or otherwise possessed limiting characteristics causing them to be rejected. Reiner (EPA) asked about the potential of using several smaller sites rather than a single 100 acre site, but Lawless (COE) indicated that no upland site was rejected on the basis of size alone. Engler (WES) indicated that in his experience this option was viable only where a pre-determined productive use (i.e. Dutch polders) of the land had been formulated, and there were overriding environmental concerns for not placing the dredge material in shallow or open water. Lang indicated that the F.W.S. had reviewed the NERBC sites and that he still favored additional investigation for NERBC sites designated as numbers 8, 9, 11, 27, 28, 30, 33, 51 and 52. D. Kidd (COE) and V. Bell (R.I. DEM) noted that all the above sites were not usable for various reasons. Reiner (EPA) commented that the land option was "just about out" but Lang, (FWS) held to the belief that the earlier noted sites should be reviewed in additional depth. The consensus seemed to be that upland disposal was not a viable option but a cursory second look should be made of some of the sites identified by the NERBC.

IV. Shallow Water Disposal

A significant amount of attention was focused upon this option, especially in the Massachusetts waters of Mt. Hope Bay for bulkheading schemes, and in Rhode Island waters for island building schemes.

R. Hebert (SRPEDD) noted that bulkheading of harbor dredge sediments to contain potentially hazardous sediments and related leachates was consistent with 208 Areawide Waste Treatment Management strategies, giving this option a planning/administrative advantage. The concept of bulkheading to eventually gain additional land was also consistent with plans to be submitted for economic development of Fall River harbor. R. Hebert submitted writen excerpts of the 208 and economic development policies noted above for inclusion in the digest appendix.

Several proposals from the private sector echoed the SRPEDD policies by calling for shorefront development through hydraulic backfilling of bulkheaded containment areas. Ed Sanchez (Sanchez Marine Services) indicated that his properties along the Old Globe Wharf area could accept 500,000 cubic yards of dredge material. A similar proposal by EG&G in the same vicinity of Mt. Hope Bay called for containerizing 600,000 cubic yards, while at Brayton Point, NEPCO indicated their willingness to accept about 3 million cubic yards at their coal pile site at Brayton Point. However, 1 million cubic yards of this volume would need to be used by NEPCO for the dredging of their access channel. Thus, at this time, private interests have come forth with possible use of shallow water sites. However, it depended

upon the suitability of the dredged materials for this use.

Bill Torpey (FRPA) stressed the necessity of utilizing the dredge spoils in a positive manner especially to benefit the part of Fall River industries which need the competitive advantage of the deeper dredged channel as well as dockside facilities.

Several panelists brought up problems or provided possible answers concerning possible shallow water containment on private properties. Engler (WES) cited the present soupy nature of the Montaup site (27) spoils long after their containment behind earthen embankments. Sanchez, however, noted the shallow bedrock conditions throughout much of Mt. Hope Bay and felt that dredged materials yielding poor foundation characteristics could be circumvented by piling through them to bedrock allowing the dredged materials to be used for light load surface uses such as parking, etc. Torpey noted that in the past, dredged spoil materials were found unusable in Battleship Cove because of poor geotechnical properties. Several investigators felt that more geotechnical evaluation was still needed to properly assess dredge spoil behavior behind bulkheaded sites. Sanchez noted that additional soils data was available from his firm, from NEPCO and from the Braga Bridge construction.

Other major and perhaps limiting problems for bulkheaded disposal to private lands includes the fact that Congress authorized the project for open water disposal. Other options can only

be exercised if they should be found cheaper than open water disposal. At present, however, the COE could not pay for containment but would pay for dredging, the States (Massachusetts and Rhode Island) would gain the land, and private interests could lease the land from the State. Aitken (NEPCO) noted that NEPCO presently had a one dollar per year - 99 year lease on filled land at their plant. Despite these shortcomings, bulkheading and filling in shallow water has to be evaluated as an alternate because of the strong interest, the fact that it is a recommended policy for some agencies (SRPEDD), and the chance for project acceptance by all entities involved in the project. Further investigation of containerized sites in Mt. Hope Bay is probably warranted.

Island building was a second principal focus of shallow water containment, and most of the discussion of this aspect centered around Spar Island within the Rhode Island waters of Mt. Hope Bay. S. Pratt (URI) submitted a formal proposal (see Appendix) for the assessment of environmental and sociological impacts of construction of a dredge spoil island in Mt. Hope Bay. Pratt also noted that the present Spar Island was a partially natural island as well as a clayey dredge spoil mound veneered by sandy and gravelly soils.

L. Murphy (R.I. Lobstermen Assoc.) pointed out successful dredge spoil land reclamation projects in San Diego and Long Beach, California, and Kennedy Airport in New York. Many other examples of this type of land reclamation are to be found within the United States.

It would appear that technical, institutional, economic and environmental considerations would govern the island building concept. Other factors include political considerations of using primarily Massachusetts dredge sediments to build an island in Rhode Island waters, and whether or not shallow water containment can be paid for under the present legislative mandate. Coleman (COE) indicated that shallow water containment would be considered by the COE, however, in order for it to be a real and viable alternative it would have to shown that it was economically feasible and that it met all other requirements (i.e. environmental, technical, etc.).

Several panelists, while believing the Spar Island site was a feasible option, were concerned about habitat changes in the area, ownership and possible user fees, and potential finished uses, as well as the cost noted earlier. Concern was expressed by Richard Burgess that dredged materials deposited at Spar Island could travel to the Cole River and result in the closure of shellfishing at that location.

Lang (FWS) was concerned about the possible lack of existing environmental baseline information in Mt. Hope Bay, especially benthos and fisheries data which would assist in assessing potential impacts. Lang was also concerned about limiting discussion of island building only to Spar Island. Other panelists (i.e. Engler, WES; Verber, USPHS/FDA) pointed out that a site previously used to dump dredge spoil would be a much easier site to use from an administrative/regulatory point of view. V. Bell (R.I. DEM) wanted to see several alternate plans developed

for Spar Island and Lang wondered whether any containment at all was needed. Finally, Engler (WES) pointed out that he did not know of a case where pollutant release and dispersal from dumped dredge spoil affected shellfish to the point of causing a closing of harvestable shellfish beds. Engler and Verber (USPHS/FDA) noted that in most cases, shellfish grounds are closed due to bacterial pollution and secondarily due to metal and toxic organic buildup, the bacterial pollution factor now responsible for the closing of Mt. Hope Bay to shellfishing. Several fishermen noted that shellfish are lost at a dumpsite by being physically covered with several feet of dredged material.

V. Open Water Disposal

Several workshop participants addressed the overall problems of open water disposal. There was a general consensus among participating agencies that proposed open water sites should be containment sites rather than dispersal sites in order to minimize the potential impacts of the dumping. E. Reiner (EPA) indicated that the EPA will have new ocean dumping regulations out by February-March, 1982. These regulations will favor the use of previous dump sites. Capt. Verber (PHS) stated that the Public Health Service was opposed to opening new disposal sites, especially in areas with viable fisheries. The PHS would consider dumping in previously used sites that had been shown to be containment sites. R. Engler (COE/WES) summarized the general concensus that it would be much more difficult to designate a new disposal site than reopening one that had been used in the past.

The various fishing interests present opposed the use of any open water disposal site, indicating that the use of such sites represented a major adverse impact to the fishing industry. Francis Manchester, owner of Manchester Fisheries and representing several facets of the fishing industry through the organization Save our Sound (SOS), stated that past dumping at Brenton's Reef resulted in substantial reductions in catch for Rhode Island fishing interests. His statistics were questioned by S. Pratt (URI) who felt the reduction was part of a lower fish population during that period that was experienced over wide areas of the eastern coast.

F. Manchester (SOS) presented reports from various sources outlining potential impacts of open water disposal and indiciating that open water disposal was not advisable. S. Pratt (URI) stated that studies of the Brenton Reef site have shown that the site has recovered and that the impact on fisheries has been that of a change from a finfisheries area to a lobstering area. Robert Smith of the Point Judith Fishermen's Coop disagreed with Pratt on lobster colonization of the former dredge spoil site. He indicated that lobster populations in that area were not high because of the muddy bottom conditions. Manchester agreed, citing evidence of a URI diving study which revealed a 10-12 foot turbid layer over the bottom at the Brenton Reef disposal site.

Engler (COE/WES) stated that given the "relatively clean" characteristics of the dredged material, the major impact of open water disposal would be the physical innundation of the area by several feet of material. F. Manchester pointed out that significant numbers of quahogs would be buried at the dump site and be lost as a fisheries resource of considerable economic value. Manchester also pointed out that the bottom contour is very important in fish trapping as it is evidently a major control for the migratory patterns of the fish. The area fishermen have come to learn these patterns over the years and set their nets accordingly. Changes in the bottom contour may disrupt migratory patterns and adversely effect catches. S. Pratt (URI) added that interference with fisheries patterns is perhaps a more important concern for the open water disposal

option of this project than sediment chemistry considerations. The impact of open water disposal according to Engler (COE/WES) would have to be accessed by determining the degree of habitat modification due to the physical burying of the site and how similar the dredged material characteristics are to those of the existing bottom material.

Several fishermen including R. Smith (PJFC) and Howard Nickerson (New England Fisheries) stated that a major problem in open water dumping is failure to control the contractor and eliminate "short dumps". In fact, according to the fishermen, open water disposal impacts a much greater area than the proposed dump site. F. Manchester stated that an area of approximately 5 miles radius (78.5 sq. miles) cannot be fished around an active dump site.

Vern Lang (FWS) asked the fishermen where dredge spoils could be put in open water if they were "clean", perhaps even attempting habitat enhancement. F. Manchester indicated that there is the potential for impacts (as previously discussed) at any site. R. Tomczyk (Mass. Div. WPC) asked if a site was designated and fishing was restricted would this represent a major loss? R. Smith (PJFC) stated that every square mile of the Sound is being used. If a dump site is designated someone will be affected. L. Stasiukiewicz (PJFC) agreed and stated that if open water disposal is utilized, the economic loss to fishermen should be included in the benefit/cost analysis for the project. Capt. Verber (PHS) pointed out that the State of Delaware had done a study in which they calculated

the economic value of their offshore fisheries per square mile.

L. Staskiukiewicz (PJFC) also pointed out that since it is so difficult to establish an open water disposal site, once a site is finally designated it will also be the prime candidate for other projects, including those with polluted sediments. There was general agreement on this, especially in view of various Federal and State agency guidelines and regulations favoring the use of "existing" sites.

The eight preliminary open water sites as identified by the COE in the information packet were reviewed. L. Bridges (MDWPC) presented information that has become available over the past few years which indicates that Buzzards Bay is a major lobster spawning area for Cape Cod Bay. Therefore, the Mass. Div. of Water Pollution Control would strongly oppose disposal in these areas. Other panelists indicated that the relatively shallow depth of the 2 Buzzards Bay sites may, in fact, warrant their elimination from consideration.

R. Tomczyk (MDWPC) suggested elimination of those sites which were dispersal sites and which had not been used for prior disposal. These would include the Acid Barge, West Hole and Buoy sites.

R. Smith (PJFC) stated that contrary to the information packet, the Acid Barge, Block Island, West and Buoy sites are heavily fished.

R. Tomczyk (MDWPC) pointed out that Wood's Hole (in the 1976 EIS) had indicated that the Brown's Ledge site was not

a containment site. They had suggested a site approximately 2 miles south of the Brown's Ledge site which they felt would be a containment site. H. Diamond (MCZM) indicated that the USGS has identified this site as a containment site. She provided two references (see Appendix) concerning past work by the USGS and Marine Research, Inc. relative to the evaluation of open water disposal site characteristics in the Martha's Vineyard Sound. L. McCavitt (MCZM) stated that if Brown's Ledge (or the site 2 miles south) can be shown to be containment sites, and if the dredged materials are relatively clean, the State of Massachusetts would probably approve the site.

Discussion of the Brenton Reef site primarily dealt with the problems of past dumping (fishermen) and various aspects of the fisheries recovery (S. Pratt, R. Engler) at the site. The fishing interests considered the past dumping to have had a significant impact on them and disagreed with S. Pratt (URI) that there has been a significant recovery of the area. The fishing interests again pointed out that they would strongly oppose (through political channels) opening a dump site in Rhode Island waters for Massachusetts spoil. They felt this to be extremely important especially in light of the fact that once designated, the site is likely to be used for other projects in addition to the proposed Fall River project.

Col. Rappaport questioned the potential use of the ordinance disposal area, southwest of Martha's Vineyard as shown on the nautical charts. The fishermen present reported that there

is little commercial dragging in this area. H. Diamond (MCZM) suggested that various interests from Martha's Vineyard may be strongly opposed to use of this site and the lack of opposition from the R.I. fishermen present may not give an accurate indication of potential concern.

In summary, it appears that the selected open water site should be one which has been previously used and can be shown to be a containment site. The fishing interests appear unwilling to agree to any open water site. Their opposition to use of the Brenton Reef site ("Don't dump Massachusetts spoils in Rhode Island waters.") may be effective politically. Because of this, it appears that the site showing most promise is the Brown's Ledge site (or the area designated by Wood's Hole to the south of Brown's Ledge). Additional sites should be evaluated which have been suggested by various investigators (i.e. Wood's Hole, USGS, etc.). Finally, if open water disposal is utilized, the effectiveness of placing stricter dumping controls on the contractor should be investigated.

VI. Recommendations for Improving the Workshop Process

The various interest groups have been familiar with the proposed project for several years. Most participants were quite aware of the available options and their positions on the issues were more or less firmly established. Because of this, the workshops were not productive in identifying new disposal options (with the possible exception of shallow water sites) as most of the options had been previously debated in detail. The workshops were most effective when participants were evaluating information and sites developed by the Corps. Given a similar set of circumstances in the future, it would perhaps be advisable to delay the workshops until more information is developed concerning the various options so that participants can be more effective in establishing the feasibility of the alternatives under consideration.

The proposed Fall River Harbor Navigation Improvement Project is one which has opposing factions. Direct benefits would accrue to commercial interests in Fall River Harbor if the project were carried out. The fishing interests perceive these benefits to be at their expense if open water disposal is used. Bill Torpey of the Fall River Port Authority pointed out that the commercial interests (especially the oil companies) are not as aggressive in expressing their position publicly as are the fishermen. Because of this, the importance and impact of the proposed project on the harbor commercial interests and the Fall River area are not completely appreciated. At

a future date it may be productive to set up a workshop involving both groups in order that each better understands the potential impact (positive and/or negative) on the other.

APPENDIX I

WORKSHOP FLIP CHARTS

AND ATTENDANCE

PANELISTS*

FALL RIVER WORKSHOP NO. 1/AFTERNOON

Vern Lang
U.S.F.&W.

Bob Engler
COE/WES

Andy Aitken
NEPCO

Rich Tomczyk
Mass. Div. WPC

Larry McCavitt
Mass. CZM

Ed Reiner
EPA

Vic Bell
R.I. DEM

Harriet Diamond
Mass. CZM

*Actual Panelists

PANELISTS*

FALL RIVER WORKSHOP NO. 2/P.M.

Vern Lang
U.S.F.&W.

Bob Engler
COE/WES

Andy Aitken
NEPCO

L. Bridges
Mass. Div. F & W

Ed Reiner
EPA

Vic Bell
R.I. DEM

*Actual Panelists

PANELISTS*

JAMESTOWN WORKSHOP NO. 3/P.M.

Vern Lang
U.S.F.&W.

Francis Manchester
Manchester Fisheries

Sheldon Pratt
URI

Capt. Jim Verber
USPHS/FDA

Bob Engler
COE/WES

Vic Bell
R.I. DEM

Rich Tomczyk
Mass. DWPC

Gene Crouch
NMFS

Harriet Diamond
Mass. CZM

*Actual Panelists

F.R. 1

FALL RIVER HARBOR

FACILITATOR

Dr. James Walsh, BEC, Inc.

RECORDER

Dr. Carlos Carranza, BEC, Inc.

FACT PERSONS, C.O.E.

Administrative: Bill Coleman, Waltham
Bill Lawless, Waltham

Technical: Dr. Robert Engler, Vicksburg WES
Del Kidd, Waltham
Forest Knowles, Waltham

PANELISTS - FALL RIVER*

R. Rheoume (NS)
GHR Eng. Co.

Saul Saila (NS)
URI

Howard Nickerson (3)
N.E. Fisheries

Alex Beichak (NS)
Marine Res. Labs

Steve Cook (NS)
106 Jenny Lind Street
Falmouth, Mass.

Bill Torpey (1)
F.R. Port Authority

Dr. Gidley (NS)
Gidley Labs

T. Gosnold (NS)
1st Selectman
Cutty Hunk, Mass.

Vic Bell (1, 2, 3)
R.I. DEM

Len Stasiukiewicz (3)
Pt. Judith Fish. Coop

R. Smith (3)
Pt. Judith Fish Coop

L. Bridges (1, 2, 3)
Mass. Div. of Fish/Wildlife

R. Tomczyk (1, 3)
Mass. Div. of Water Pollution Control

*Preliminary List

(NS) - No Show

PANELISTS - FALL RIVER*

Harriet Diamond (1, 3)
Mass. CZM

George Seavey (3)
CRC-URI

Sheldon Pratt (3)
CRC-URI

Dave Borden (3)
DEM-Fish/Wildlife

J. Beattie (NS)
DEM Coastal Res.

J. Lyons (NS)
CRMC

A. Aitken (1, 2)
NEPCO

Capt. Jim Verber (3)
U.S.P.H.S.

Bob Dinnie (NS)
Montaup Elec.

*Preliminary List

(NS) - No Show

F.R. 4

PANELISTS - FALL RIVER *

Francis Manchester (3)
Manchester Fisheries

Vern Lang (1, 2, 3)
U.S.F.W.S.

Bob Engler (1, 2, 3)
COE/WES**

Mike Bartlett (NS)
F.W.S.

Ed Reiner (1, 2)
U.S. EPA

Larry McCavitt (1)
Mass. CZM

Gene Crouch (3)
NMFS

*Preliminary List
**Also Fact Person

F.R. 5

VERN LANG
F.W.S.

Question of Cleanliness of Dredged Spoils

1. Top Layer - "Maintenance Layer"

2. Parent Layer - Below to 5' depth

Composite sample dilutes top layer effect.

Mortality Figures (Bioassay) thus in question; especially Brenton Reef

F.R. 6

RESPONSE TO F.W.S.

Del Kidd - COE
F. Knowles - COE
R. Tomczyk - DEQE
R. Engler - COE
L. McCavitt - CZM

Samples were cores.
Analyses by Discrete layers.

Bioassay by bulk (batching) sampling; EPA felt this would stimulate behavior at dump site.

F.W.S. - What about priority pollutants?

CZM - Scheme (129) of sampling recommended to COE

F.R. 7

RESPONSE TO F.W.S.

Vic Bell - "Surprised" at results. In "error"? Need to concentrate on sites. Mix of options for disposal possible?

H. Diamond - CZM - Results of sediment testing different than other investigations. Why? - Asked to Del Kidd. Methods? Environmental Factors?

R. Burgess - Swansea - Release of contaiminants to water column and tidal forces. J. Walsh - Refer to Elutriate test results.

F.R. 8

DREDGED MATERIAL CHARACTERISTICS/EFFECTS

Bob Engler, WES - Release limited to 100-200 yardst of dredge - no shellfish closures known due to dredging operations of type envisioned.

Mr. Burgess concerned about turbidity - loss of jobs - V. Lang/ Bob Engler - closures due to sewage outfalls/bacteria and sludges.

F.R. 9

CONSENSUS?

DREDGED MATERIALS

(Lang) F.W.S. - Bioassay/Bioaccum. studies of maintenance layer also toxic scan (P. pollutants), sandworm mortality, upland sites need Priority Pollutant analysis.

Engler - Pollution not limiting - wide range of disposal options available.

Swansea Cons. Comm. - Pollutants "10 X" allowable levels for Hg, Pb, Zn, Cd have been reported in other areas of Bay.

F.R. 10

D. Shepardson - Mass. EOEA - Does dredging method affect impacts in upland area?

Engler - Care for aquifers nearby needed.

"Save the Bay" - Concerns about who gains from project - i.e. EG&G social costs not included in studies to date - environmental costs to fishing areas, etc.

L. Bridges - Mass./F.W. - Bay closures due to bacteria only.

F.R. 11

UPLAND DISPOSAL OF DREDGED SPOILS

NERBC - Screening

COE/Evaluation - reduces to Site "27"

But not available - approved fly ash disposal so zero sites at present.

Ed Reiner - Has COE looked at combining upland sites?

Bill Lawless/COE - NERBC sites rejected for reasons other than size.

F.R. 12

F.W.S. (Lang) - Portions of several sites usable - 27, 28, 30, 33, 50, 51, 52, 8, 9, 11, 12 (Fields, gravel pits, etc.)

COE/Del Kidd, V. Bell (R.I. DEM) - Sites not acceptable despite F.W.S.

H. Diamond - CZM - NERBC - Broad based, look harder.

D. Shepardson - EOEA - Can spoils be dewatered?

COE - No!!

Col. Rappaport - Upland preparation/site costs not eligible for Federal $$$.

F.R. 13

UPLAND SITES

Coleman (COE) - Has looked for others. No one has come forth.

McCavitt - CZM - No good site in Massachusetts

Engler - Sophisticated dewatering facilities needed - Dutch polder experiences. Must have land use in mind as 4-5X volume of solids are moved.

V. Lang - Bucket dredge? Volume problem - cost of trucking 4×10^6 yds.^{3}

Engler - \$.15/yd^3 vs \$15/yd^3 (ballpark)
(Hydraulic) (Bucket)

V. Bell - Should expensive options be evaluated?

Col. Rappaport - Loot at - then dismiss

F.R. 14

Reiner, EPA - Dismiss upland sites?

Lang - F.W.S. - No, look at

V. Bell - Look at but very few - Lang agrees

CONSENSUS

No upland sites but look a little harder.

SHALLOW WATER DISPOSAL

Spar Island - containerized or not.

V. Bell - Look at carefully - riparian rights? ownership? environmental effects?

R. Hebert - SERPD - 208 Study - Disposal nr. dredge site - bulkheading.

F.R. 15

B. Burgess - Spar Island needs to be containerized - wind - dispersal.

Lang/F.W.S. - Size of island fill?

Engler - Lose habitat in shallow water - gain some other (i.e. marsh).

Lang - Does site have to be contained?

CONSENSUS

Look at Spar Island cost of bulkheading? Feds pay if cheaper than open water disposal and no private interests served.

COE/Coleman - Sanchez (Sanchez Fisheries) - What if a private site or sites is cheaper? Coleman - If it is found cheaper to pump behind a containment structure than to go to open ocean disposal this could be considered but the Corps could not cost share in the containment structure(s) itself. We could not subsidize private interests.

F.R. 16

COE/Lawless - Project is authoirzed for open water disposal only - at present.

Ed Reiner - Depth of water near Spar Island?

COE/Lawless - 0-15' over 200 acres ± site required.

V. Bell - Look at all alternatives for Spar Island.

D. Shepardson - Dewatering a big problem with island vs. marsh.

Sanchez - Make land to benefit maritime trade - not marsh.

F.R. 17

V. Lang - F.W.S. - Other shallow water sites?

Where did dredged spoils go in 1950's? Need dredging history.

Bell/McCavitt - URI report tells where.

Sanchez - Look at areas along rail road tracks. Area south of Globe Wharf, Phillips Yacht Club, Kennedy Park. Also number of pier to State pier over bedrock - Old Penn Central site - EG&G site 500,000 to 600,000 cy?

F.R. 18

A. Aitken - Brayton Point site available. Plans being readied for COE. At least suitable for coal pile - previous use of spoil dumpings. 3×10^6 yd^3

B. Torpey - F.R.P.A. - Once investigated use of spoils for Battleship Cove - no good - like "cold cream". How can a landfill seriously be looked at now?

Engler/COE - Need soils engineering analysis.

Sanchez - Foundations on piles - made land for parking/walking.

Aitken - 1959-1960 dredgings used by 1962 for coal piling - fine!!!

CONSENSUS

Look at containerized island site primarily. Final look dependent upon environmental/economic factors.

F.R. 19

Total Shallow Water Site Volume "Available" 4 X 10^6 yd^3

Aitken - Leased filled land from Massachusetts for 99 years. NEPCO paid for site work.

R. Hebert - What about channel - dredging number of Brightman Street Bridge

COE/Coleman - Needed to do/justify upstream dredging. EIS will be phased to fit contemplated bridge reconstruction.

F.R. 20

OPEN WATER SITES

8 Preliminary Sites Noted

Tomczyk - DWPC - Brown's Ledge not a containment site - 1976 Wood's Hole study. Another site 2 miles south better!

H. Diamond - What about other sites such as Wood's Hole sites containment area - not finished.

Kidd/COE - Will look at - evaluation will cover all sites brought out.

Lang - Benthos data? Diamond - none - needed. Fisheries information available - Bridges.

Bridges - Sites 7, 8 out - Buzzard's Bay large lobster spawning area.

F.R. 21

Lang - Criteria for creating spawning - nursery areas? vs. available information.

Bridges - Fishermen will oppose deep water disposal.

Lang - Use dredge spoils for beneficial ends. Old traditional sites were not picked with ecological constraints.

Tomczyk/Engler - Use traditional site - easier from regulatory standpoint in R.I.

V. Bell - Don't just look at Brenton Reef "R.I. Disposal Site" (?)

Torpey - Concentrate on Brenton Reef - V. Bell - we're looking at it closely - CRC likes it. Need more information - recommended by URI as dump site.

F.R. 22

Engler - Some EPA data to support Brenton Reef disposal site - Bioaccum.?/Bioassay?

V. Bell - Brenton Reef designation a long process.

Torpey - Analysis over 25 years top heavy with environmental inputs, etc. Time to look closely at commercial fishing industry economics.

Tomczyk, McCavitt - Regional site needed for Massachusetts/Rhode Island harbors - not just for Fall River project.

Engler - EPA again looking at ocean dumping.

CONSENSUS

Brenton Reef a possibility but controversial.

F.R. 23

Reiner - New ocean dumping regs. - Fall 81 - Use a dump as a future dump. No degradation of "clean" waters.

Tomczyk - Long haul sites o.k. with Massachusetts

Bell - Brown's Reef/Brenton Reef/Wood's Hole sites - best.

Reiner - Containment better in this case. Acid barge not good - ditto west hole, buoy site (dispersal).

COE/Kidd - Site selection was random to get a basis for discussion.

Diamond/Bell - More data is available.

F.R. 24

Tomczyk - Naval dump site should be looked at; Wood's Hole letter to 1976 DEIS

Bridges - R.I./F.W.S. - Fisheries data acknowledged by Bell.

Aitken - Site 106 ERCO study.

Engler - Habitat alteration will be major impact - try to match bottom conditions to dredge spoils.

CONSENSUS

Sites 7, 8 - poor; N. Bedford too shallow. Others should be looked at.

Brenton Reef, Brown's Ledge, Wood's Hole sites look best.

F.R. 25

A. Aitken - Physical data in tables - top 3" (?)

COE/Kidd - No. - over 5' depth

Meeting Closed
4:40 p.m.

F.R. 26
P.M.

SUMMARY P.M.

Dredged Materials - Charact./Effects

Consensus: - Relatively clean materials

Some concerns registered by F.W.S. on compositing of samples for Bioassay/Bioaccumulation - conclusions.

Engler/WES - Reported on lack of shellfish closures due to dredged spoils.

F.R. 27

SUMMARY UPLAND DISPOSAL

NERBC - Screening reduced to site 27 - later removed due to unavailability - future power plant site.

No feasible new upland sites offered - F.W.S.

Engler - Upland site only if 1) productive use; 2) overriding environmental considerations. Suggested a re-look at some sites - to be done.

General Consensus: - No Sites - still to look!!

F.R. 28

SUMMARY - SHALLOW WATER DISPOSAL

Sites Considered Feasible - Need Additional Investigation:

1. Spar Island - Especially with containment

2. Private sites

   A. Sanchez 1/2 million c.y.
   B. EG&G 0.6 million c.y.
   C. Brayton Point
      NEPCO 3 million c.y.
      (1 million theirs)

Problems

1. Environmental
2. Legal
3. Geotechnical

F.R. 29

SUMMARY - OPEN WATER DISPOSAL

1. Brentons Reef

2. Brown's Ledge
   (South - Wood's Hole site)

Buzzard's Bay Sites:

1. Major lobster spawning area
2. Shallow

Problems with Other Sites:

1. Legal/Administrative
2. Environmental

F.R. 30

NEW INPUT FOLLOWING P.M. SUMMARY (EVE.)

E. Providence Coastal Comm. - Beneficial aspects of spoils for beaches?, etc. Blending w/fly ash - roadside use?

Reiner - G.W./Surface water pollution infeasible? - $4 \times 10^6 \times yd^3$

Aitken - Fly ash vols. small rel. to spoils

V. Lang - No upland sites - not consensus F.W.S. - wants this looked at. Also disagrees on "cleanliness" of spoils.

Meeting Over 7:45 p.m.

F.R. 31

V. Bell - Where to go following scoping? Inputs between workshops/DEIS

Lang - Open water/shallow water sites lack data for meaningful conclusions. Number of sites too limited - need a better screening process.

COE/Kidd - Must limit options - resources.

COE/Lawless - Expensive studies did not produce usable results - stick with fisheries concerns.

Bridges - Need deep water containment - must dredge New Bedford harbor - PCB's.

Bell - (Cites fishing interests) - No New Bedford spoils at Brenton Reef.

J. 1

FALL RIVER DREDGING PROJECT

DREDGE SPOIL CHARACTERISTICS/CONCERNS

Capt. Verber - USPHS - Sediments in channel bacterially a problem. Planning to take 10 samples on 7/16.

R. Pond - "Stripers Unltd." - Contamination of striped bass/menhadden now a problem. PCB, pesticide, metal accum. in mesenteric tissue - believes bacterially activated. Claims aquarium tests do not duplicate. Should do a broad spectrum - bioassay.

Lang/FWS - How to do such a broad spectrum analysis? Freezing of tissues arrests bact. action. 5' compositing dilutes pollution.

J. 2

Engler/WES - Bacteria decomposition not related to PCB uptake aquaria tests do not arrest bacterial action - more optimum temp. PCB's related to sewage/industrial waste discharges. Lower PCB's noted due to clean up. Comments by Murphy/Tomczyk/Diamond related.

Pratt - URI - Channel deepening lowers productivity for shellfish - sediment sink - especially for fines below wave base. Hg stays in sediments - also PCB's but we need to be sure - clam studies.

Nickerson - No dumping in water!! Can't control dumpmaster.

J. 3

V. Bell - Not "hazardous" - legally.

Lang - What about Priority Pollutant Scans - 129 pollutants.

C. Verber - Dump only in areas already being dumped in - not clean sites.

Engler - Dredge induced turbidity small relative to vessel movement in same channel.

Len S./Engler - 7' of any sediment won't help clams.

CONSENSUS?

Generally clean - but additional studies on bacteria/bioassay/ toxics needed. Must be tied to disposal site environment.

J. 4

OPEN WATER DISPOSAL

F. Manchester (SOS) - Effects of dumping off Newport. Reduced fish harvesting, storm resuspension, burying of ocean quahog grounds, quahogs polluted 5 miles away, violates marine sanct./ Protection Act of 1971, 10-12' turbid layer - Brenton Reef, Brenton Reef will become regional polluted site if opened again, bottom contour critical to migratory fish trapping.

S. Pratt - Fish prod. lost goes to lobster grounds. Interference with fishery migration most important effect of spoil dumping.

J. 5

H. Diamond - USGS/WHOI containment area studies - why not used?

R. Allen - Nothing New!

Tomczyk - New information on dredge spoil disposal effects - also clean spoils.

Smith - Disputes Pratt theory of lobster recolonization of fishing grounds - too much rocky bottom in Narag. Bay/Sound - ideal sandy bottom rare.

Site 4 - Large fishery 75-80' boats
Site 6 - Heavily fished
Site 3 - Heavily fished
Nav. Ord. Site - Gen. avoided (Verber also)
Ocean dumping - Scattered/unregulated occurrence

Bell/Smith - Site picked to be used indefinitely?
Len S. - What then?

J. 6

Len S./Smith - Every square mile of Sound fished in one way or another.

Manchester - Affected area could be approximately 100 miles?

NO SITES DEFINITELY IDENTIFIED - PROBLEMS WITH THOSE IN INITIAL SCREENING.

APPENDIX II

WRITTEN COMMENTS

WORKSHOP AGENDA

Studies of open water disposal sites recommended by Harriet Diamond (Mass. CZM):

1. "Geology and Shallow Structure of Eastern Rhode Island Sound and Vineyard Sound Massachusetts", USGS (Falmouth)

2. "Sediment Characteristics of the Continental Shelf Dumping Area South of Martha's Vineyard", Marine Research, Inc., 141 Falmouth Heights Road, Falmouth, Massachusetts 02540

15 JULY 1981 - SHELDON PRATT — U.R.I.

PROPOSAL CONCEPT

Assessment of Environmental and Sociological Impacts of Construction of a Dredge Spoil Island in Mount Hope Bay

Dredged channels and turning basins are major features of Mount Hope Bay. These areas need periodic maintenance dredging. A proposal has been made to deepen the channels from 35-40 feet. This "improvement" dredging would create up to 4,000,000 cubic yards of spoil.

In the past, disposal sites for Mount Hope Bay has included deeper parts of Narragansett Bay, marshland in the Taunton River, the shores of Common Fence Point, and Spar Island in the middle of the Bay.

It will be difficult to locate an offshore disposal site for spoil from Mount Hope Bay because of the large volume involved and the presence of pollutants in its upper portion. Mercury is present in Taunton River surface sediments as a result of past discharge from a chemical plant. Metals, oil, and organic matter have entered the Bay from river sources and discharges from combined sewers and the Fall River sewage treatment plant. Petroleum transport and storage at both Tiverton and the head of the Bay are potential sources of hydrocarbons.

Potential effects of disposal within Mount Hope Bay and information needed to assess these effects were discussed in the draft EIS and in Seavey and Pratt's report on dredging in Rhode Island. It is proposed to take these discussions one step further. There now exists data on the hydrography and biology of Mount Hope Bay which could be analysed as an aid to predicting potential effects of dredging and spoil disposal. Public comment and institutional constraints could be elicited by presentation of alternative in-Bay disposal options. It will be very important to determine the minimal containment necessary to satisfy real and perceived sediment pollution problems.

The following outline lists tasks which could be undertaken at this time. Many scientific and planning specialities are included in this outline. It is suggested that for efficiency and an integrated analysis these tasks should be carried out by the smallest number of agencies or consultants. Minimizing the size and duration of an assessment project would prevent waste of resources on unacceptable alternatives. A 6-9 month project and a funding level of 15-20 K would be adequate for the next stage of planning.

Outline of subject areas for data collection and analysis. Some source agencies and consultants are suggested.

Engineering (Corps of Engineers Data)

1) Cost and availability of techniques for dredging and deposition which retain sediment cohesion and minimize turbidity.

2) Cost and availability of techniques for retention and protection of spoil.

3) Load bearing ability of present sediment and spoil.

4) Schedule of dredging.

5) Physical properties of potential spoil.

Geology

1) Waves and tidal currents and heights at site.

2) Present slopes and sediment parameters of intertidal and subtidal areas of Spar Island and Mount Hope Bay. (field project)

3) Projected minimum shore protection and directions of beach transport for an island.

Hydrography

1) Review of tidal currents and particle stratification of water (Marine Research Inc. data) in Mount Hope Bay.

2) Projection of water quality during dredging and construction and changes in Bay circulation due to island.

Legal

1) Determine claims of ownership, mechanisms for state control, ability of opponents to stop project.

Chemistry

1) Obtain content of "releasable" pollutants and plant nutrients in spoil (Corps of Engineers).

2) Project water quality during construction; possibility of release from island associated with particulate water, ground water, translocation by plants. (recent literature)

Biology

Fisheries

1) Obtain spatial and seasonal pattern of present and potential fisheries resources (RI, Mass., Marine Research Inc., data)

2) Obtain schedules of fisheries reopening with pollution control.

3) Project effects of turbidity, changes in depth, and changes in sediment type on fisheries resources.

Benthos

Discuss potential effects in terms of fisheries resources, fish food, and pollution indicators (Marine Resources Inc., URI data)

Vegetation

1) Describe species found on the Bay shores (field project)

2) Cost and availability of planting

3) Obtain materials illustrating marsh and beachgrass establishment (Garbisch consultant, URI)

Birds

Describe potential use of island by birds with various use options.

Recreational Uses

1) Describe needs for recreation in the Bay area, and the past and present uses of Spar Island.

2) Develop alternative use plans for an island.

Aesthetics

1) Develop concept sketches of island(s) (landscape architect consultant)

2) Conduct interviews with residents from all communities around the Bay concerning attitudes towards Bay and future islands. (field project)

SOUTHEASTERN REGIONAL PLANNING AND ECONOMIC DEVELOPMENT DISTRICT
MARION, MASSACHUSETTS 02738, Tel. (617) 748-2100

ROLAND HEBERT
SRPEDA

REGIONAL TRANSPORTATION PLAN

LONG RANGE ELEMENT

SPECIAL UPDATE

OTHER MODES- REGIONAL SEAPORTS

II-C-3

JANUARY, 1981

This Technical Memorandum acts as an update of the Other Modal Plans portion of Section II, Long Range Element, of the current Regional Transportation Plan for southeastern Massachusetts (December, 1980), and deals specifically with Chapter 3, Seaports. Prepared under Contract No. 21082 with the Massachusetts Department of Public Works in cooperation with the Federal Highway Administration, this Technical Memorandum has been developed as required product under Task 2.1, Development of the Transportation Plan, of the current Unified Work Program.

REGIONAL SEAPORTS

A. Introduction

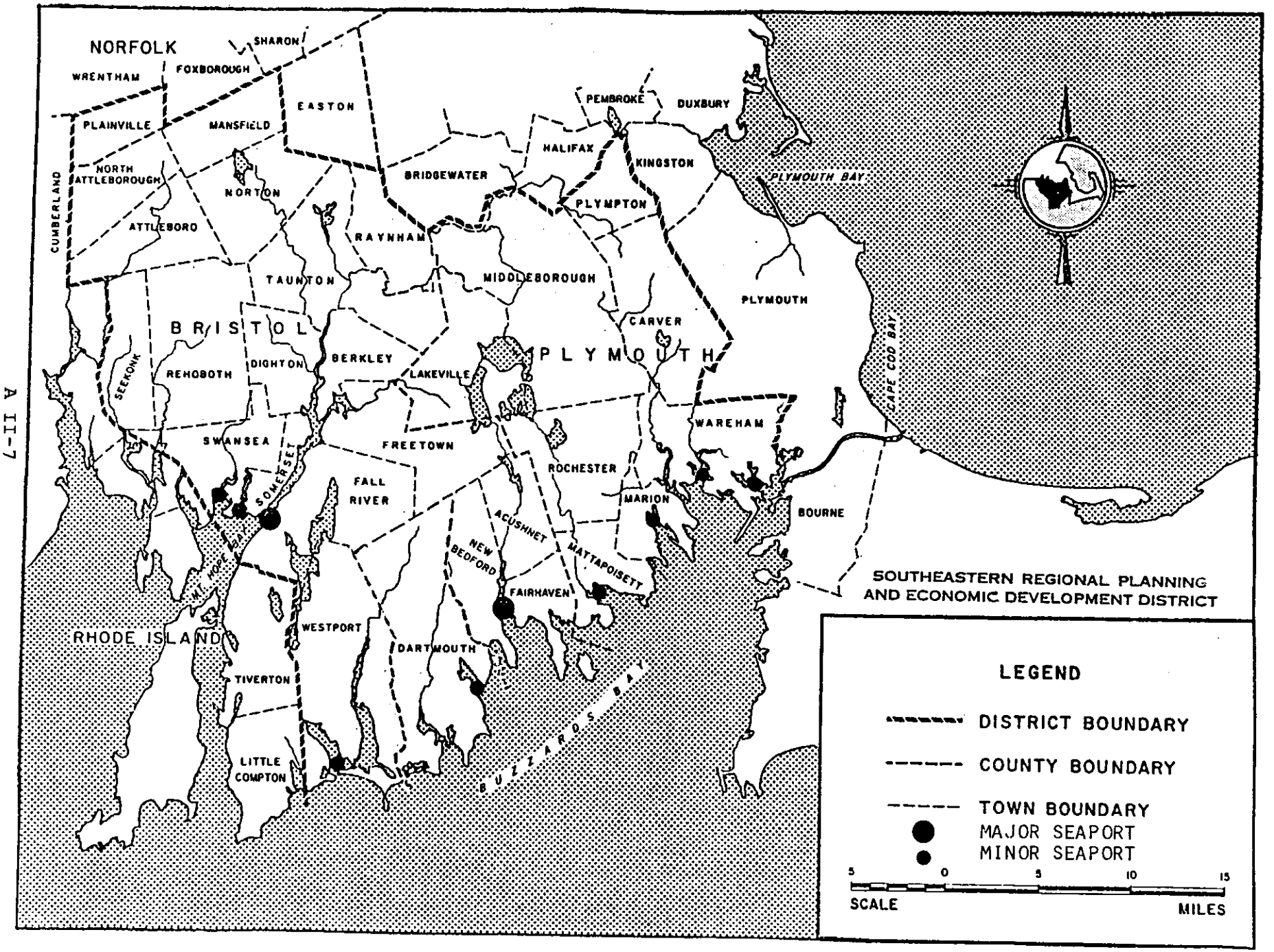
The historical development of the SRPEDD communities which border on the Mount Hope and Buzzards Bays and their tributaries have, for the most part, been a function of their proximity to the sea. The economy of New England and the entire United States at one time relied upon the port activity of these and other New England ports. Though the economic livelihoods of these southeastern Massachusetts communities are less reliant on the sea today than in previous generations, seaport and waterway activities continue and prosper through fishing, freight transport, recreational boating, marine construction and repair, and passenger transport. The communities collectively are also the loci of a healthy tourist trade based upon the sea and recreational amenities offered by the active and picturesque ports.

As can be seen on the accompanying map, there are two major seaports in the SRPEDD region, New Bedford-Fairhaven, and Fall River, as well as several lesser seaport communities including Swansea, Somerset, Westport, Dartmouth (Padanaram), Mattapoisett, Marion, and Wareham.

B. Port of New Bedford-Fairhaven

The harbor at New Bedford-Fairhaven has a channel 30 feet deep with a width of 150 feet at the hurricane barrier. A 28-foot deep channel extends from there to the Route 6 Bridge, and continues north approximately 1200 feet where it enters a 12-acre federal maneuvering area with a depth of 30 feet at mean low water. A similar 22-acre maneuvering area is maintained in the lower harbor. A map of the harbor is provided on page 3.

The port of New Bedford-Fairhaven has a rich and romantic seafaring history which extends as far back as pre-colonial times when local Indian tribes set forth from the harbor in search of fish and whale blubber and bone. Whaling as an industry began as early as 1750 in New Bedford village, and by the mid 1800's this port was the premiere world center of the whaling trade.


NORFOLK
SHARON
WRENTHAM
FOXBOROUGH
EASTON
PEMBROKE
DUXBURY
PLAINVILLE
MANSFIELD
HALIFAX
KINGSTON
PLYMOUTH BAY
NORTH ATTLEBOROUGH
CUMBERLAND
NORTON
BRIDGEWATER
PLYMPTON
ATTLEBORO
RAYNHAM
TAUNTON
MIDDLEBOROUGH
PLYMOUTH
CARVER
BRISTOL
PLYMOUTH
SEEKONK
REHOBOTH
DIGHTON
BERKLEY
LAKEVILLE
CAPE COD BAY
WAREHAM
SWANSEA
FREETOWN
ROCHESTER
SOMERSET
FALL RIVER
MARION
BOURNE
ACUSHNET
NEW BEDFORD
MATTAPOISETT
FAIRHAVEN
RHODE ISLAND
WESTPORT
DARTMOUTH
TIVERTON
LITTLE COMPTON
BUZZARDS BAY
SOUTHEASTERN REGIONAL PLANNING AND ECONOMIC DEVELOPMENT DISTRICT
LEGEND
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COUNTY BOUNDARY
TOWN BOUNDARY
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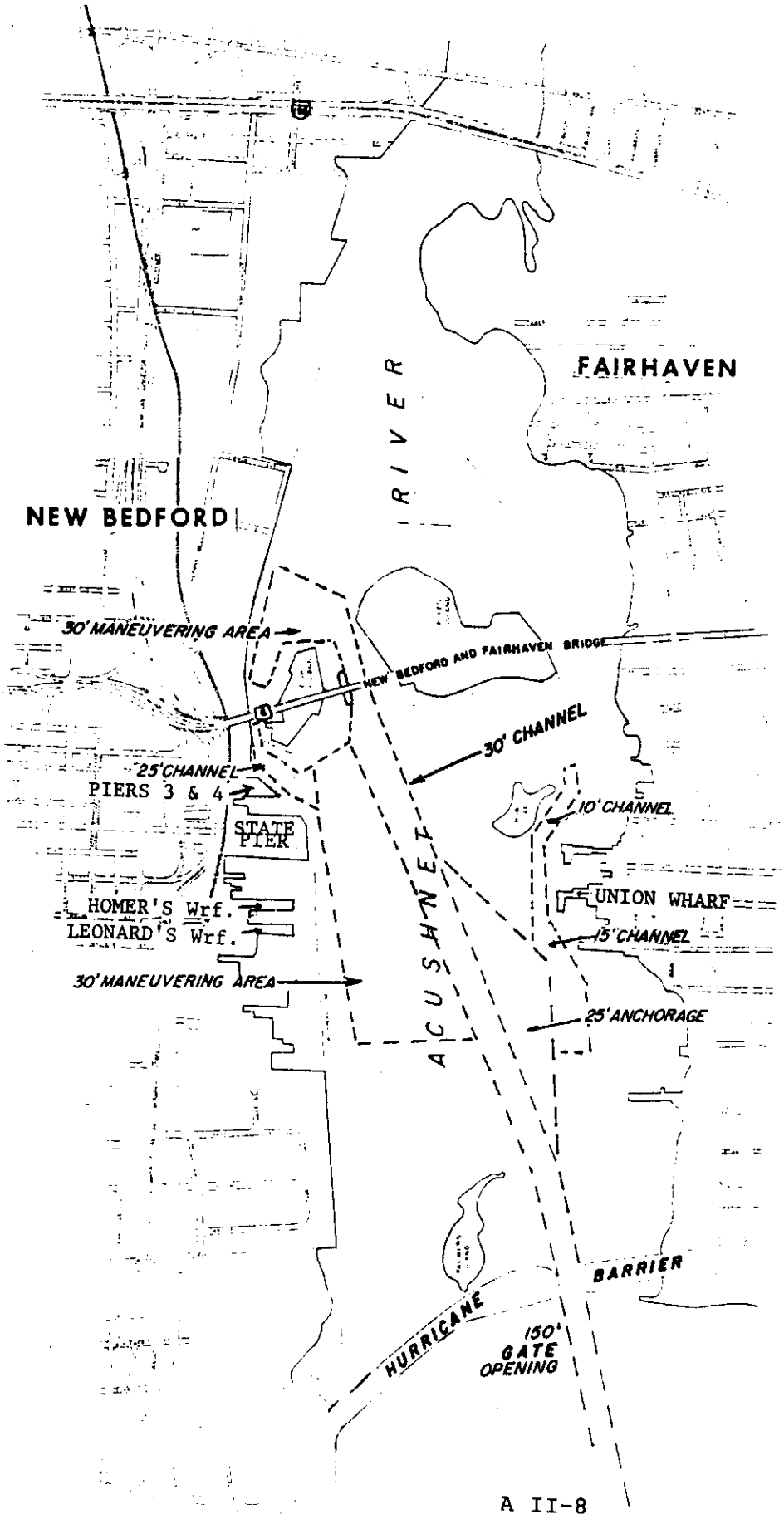
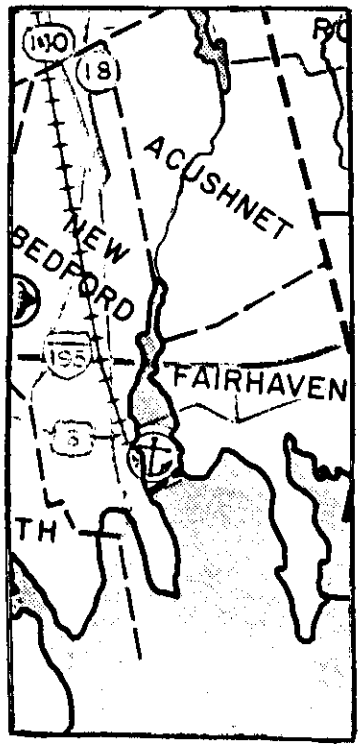




PORT OF
NEW BEDFORD–
FAIRHAVEN

In 1845, the industry's peak in New Bedford, dock receipts totalled 158,000 barrels of sperm oil, 272,000 barrels of whale oil, and three million pounds of whalebone from ships manned by 10,000 men. The industry was so successful that the City is reputed to have had the highest per capita income of any world city at that time. Whaling from New Bedford-Fairhaven continued until the first World War, but had been a dying industry since the advent of the fossil petroleum industry after the Civil War. At that time, New Bedford's economy turned to cotton milling, which developed to such a degree that by the early 1900's the City was the country's premiere cotton center.

The port had a major role in the development of the oil industry in that the petroleum refining process was first devised on Fish Island in the New Bedford Harbor. Even today New Bedford-Fairhaven is a major receiving port for petroleum products. Some 162,000 short tons of various petroleum products were received during 1977 at this port, according to the Army Corps of Engineers. This is about 65 percent of all cargo tonnage received there in that year.

The port is presently viewed as a potential site for support activity of exploratory oil drilling on the Outer Continental Shelf to take place soon. Vacant space on the waterfront is still available for development, and the extensive cargo handling facilities, maritime design and repair capabilities of the port and the staff of its various firms are a natural adjunct to this offshore exploration. Two test wells sunk in early 1980 show promising prospects for full-scale exploration. Drilling on tracts apportioned at the first sale of shelf tracts is expected to begin in the Spring of 1981. An Environmental Impact Statement for drilling in tracts farther out in the Atlantic is expected in September of 1981 and the second sale of these tracts is scheduled for October, 1982.

This same outer shelf is also the site of the marine-rich George's Banks which supplies New England fishermen with one of the richest stocks of fish and scallops in the world. The New England fishing fleet now numbers 780 vessels, 180 of which, or 23 percent, call New Bedford-Fairhaven home port. Only Gloucester fishermen bring in a larger catch than New Bedford fishermen in all New England, but New Bedford's catch is worth more in dollar value, and this makes the port the foremost fishing port on the East Coast.

The fishing industry has been developing here since the 1930's when the milling interests left for the South. It was during the late 1930's that the port first gained prominence as a seafood center through the use of refrigerated trucks and freezing processes which allowed for wider sale of the abundant catch.

New Bedford currently ranks eleventh among the nation's major ports in volume of fish landed. In 1980, over 99 million pounds of fish were brought into New Bedford's port by local fishermen. The market value of this poundage was over $71 million (a little over half of which was from scallop sales) due to the high price that New Bedford catch warrants on the market. New Bedford is the world's scallop capital, and its fleet also catches valuable cod, haddock, blueback and yellowtail flounder in abundance. The harbor's waterfront contains eleven fish handling and processing facilities, and according to the National Marine Fisheries Service, the fleet and the supportive processing facilities handle the fifth most valuable catch in the nation (1980 figure), following two Californian tuna ports and two Alaskan king crab ports.

New Bedford's prominence in the fishing industry in New England is now being challenged by developing fleets in Portland, Maine; Newport, Rhode Island; Gloucester, and in Boston which is redeveloping activities at its fish pier with an $11.5 million improvement project. Also countering fishing activities at New Bedford is the preponderance of fish imports from Newfoundland and Nova Scotia. Presently, the United States places no quota on fish imports, which now exceed 60 percent of fish purchases in this country. So a steady demand for fish, which is countered by larger fishing fleets, necessarily bringing in smaller catches, keeps incomes for vessels and crews smaller with each passing year, despite rising operating costs which are not mirrored in the price of fish at the dock. This has caused unrest during the past year among New Bedford fishermen who are requesting government action to limit fish importation rather than subsidization of the fleet to keep the activity lucrative for the fleet at New Bedford-Fairhaven.

Canada is now the world's largest exporter of fish products, and during the first three months of 1980 its fleet supplied New England with over 16 percent of the cod consumed. The Canadian Government subsidizes their fishing industry by up to 30 cents per pound of catch, as well as offering their fishermen cheaper fuel prices, which then acts to keep market prices here for their products as much as 15 cents cheaper, which in turn acts to further reduce prices for fish caught by U.S. fleets.

The U.S.-Canadian Fisheries Treaty, which has been tied up in the Senate for nearly two years, and which would have permanently entitled Canadian fishing concerns to certain percentages of fish from George's Bank and other fertile fishing areas if enacted, was in early March of 1981 vetoed by the Reagan Administration. The Treaty has been viewed by New England fishermen as unduly favorable to Canadian fishermen (for example, the Treaty would have assured the Canadian fleet access to one third of the territory in George's Bank, and up to 75 percent of the scallop catch from that area), and they have lobbied strongly against it through their congressmen. A separate Boundary-Settlement Treaty which will set specific ocean boundaries for fishing by both countries' fleets in George's Bank must still be acted upon the U.S. Senate.

In addition to foreign fishing vessels unloading as much as five million pounds of frozen fish per year at New Bedford-Fairhaven, fish is also trucked in for processing from Sandwich, Barnstable, and Provincetown, Massachusetts, and from Newport, Rhode Island.

The fishing industry is the principal user of the nine miles of New Bedford-Fairhaven waterfront. The harbor is protected by a hurricane barrier and dike built in 1966 at a cost of $18.6 million. This barrier is designed to obviate up to 80 percent of damange to the port in the event of a hurricane similar in force to the 1938 and 1954 hurricanes.

The construction of the barrier has done much to encourage development of harbor facilities. The harbor channel measures 350 feet wide by 30 feet deep. The eight-acre State Pier has 1800 feet of berth space and 97,000 square feet of storage area.

The port's North Terminal is served by an active rail yard and both North and South Terminals have vacant parcels available for development. The pier facilities on the New Bedford waterfront have been completely reconstructed in recent years. The major fishing piers, Piers 3 and 4, have been combined into one facility with an EDA grant; and Homer's and Leonard's Wharves have been rebuilt with Urban Renewal funds. In Fairhaven, the waterfront contains four marine railway yards which are capable of servicing vessels of up to 120 feet in length. Fairhaven's Town-owned Union Wharf has recently been rehabilitated by the Commonwealth, and the other piers are in generally good condition. The acute shortage of dock space throughout the harbor is felt particularly in Fairhaven. The Town is now considering a plan to revitalize the village and waterfront through designation of a Commercial Area Redevelopment District which would provide for the use of tax-free revenue bonds to stimulate private business.

A major hindrance to full development of the northern half of the port are the difficulties presently experienced by large vessels maneuvering through the narrow 95-foot wide opening at the swing span of the Route 6 New Bedford-Fairhaven Bridge which is now nearly 80 years old. Most large tankers now in use are too large to pass through the opening with adequate clearance, and ships of a beam narrow enough to pass are often hindered by strong prevailing winds. The low vertical clearance of six feet makes openings for nearly all navigation mandatory. Since the expansion of the Frionor fish processing plant in the Spring of 1980, there has been a marked increase of bridge openings, particularly for fishing vessels, from a monthly average of 50 openings a month to over 185 openings. Between May and October of 1980 a total of 1116 openings of the swing span were required, compared with a yearly total of 559 during 1975. We can estimate a yearly total of over 1600 openings for 1980, a total, which if development of fish processing facilities at the North Terminal continues, could reach within a year or two the 1969 record high of 2852 openings.

In their Draft Environmental Assessment for the bridge replacement, the consultant firm of Sverdrup and Parcel and Associates projected that if offshore oil support activities were to take place north of the Route 6 bridge, some 3600 bridge openings per year could be expected initially, with up to 4800 openings required in the year 1985. Offshore oil support activities have not occurred as expected, but rather the unexpected growth of fish processing activities north of the bridge have occurred, which negates the estimates for required openings to some extent for this time period.

A Corridor Planning Study for the bridge was conducted by SRPEDD in 1975 and 1976 in cooperation with the City of New Bedford and the Town of Fairhaven, and the Study found that the then present and future projected auto traffic on the bridge, and the then present and future projected marine operations requiring bridge openings will necessitate the construction of a new double bascule draw-bridge facility with a channel opening of 150 feet horizontal clearance and a minimum 20 foot vertical clearance. The 580 foot long structure has undergone a number of major repairs, most recently in 1961, and the western end was replaced in 1972 to connect the bridge to Route 18 in New Bedford.

Controversy involving the vertical height of the bridge in the closed position came to an end in November, 1980, upon the decision of the MDPW to build at a height of 20 feet. The Environmental Impact Statement for the project is expected to be completed during 1981, and after Federal review and approval, a design contract can be initiated. At present, the projected date for construction of the new bridge is 1985, at an estimated cost of $22.2 million.

The New Bedford-Fairhaven harbor is also the host to an active tourism industry focused on the waterfront with its recreational and historical attributes. Passenger ferry service to and from Martha's Vineyard is available May through October, as is unscheduled passenger service to Cuttyhunk. Seasonal harbor and Cape Cod Canal cruses are also available to tourists from New Bedford. New Bedford's Historic District is located adjacent to the State Pier, and the H.M.S. Rose, a replica of the 1774 British frigate is now in New Bedford harbor offering visitor tours. At some time in the near future a permanent place for the ship within the harbor will be chosen.

Much of the New Bedford-Fairhaven harbor is actually the mouth of the Acushnet River. Tests conducted by the Environmental Protection Agency on river bottom sediment in 1976 found concentrations of the toxic industrial chemical PCB's of from 53 to 56 parts per million, among the highest levels of these chemicals in the United States. The EPA found two local firms responsible for discharging the chemicals into the river, and since 1978, has prohibited the use of PCB's in manufacturing. As a result of these 1976 findings, the Massachusetts Department of Public Health has banned fishing and lobstering from South Dartmouth to Fairhaven, including the inner harbor of New Bedford-Fairhaven. More recent

tests on sediment samples from the harbor have found that true levels are actually up to 150 to 200 parts per million. The Commonwealth's Water Resources Commission has approved a $35,000 grant to study cleanup methods on the River.

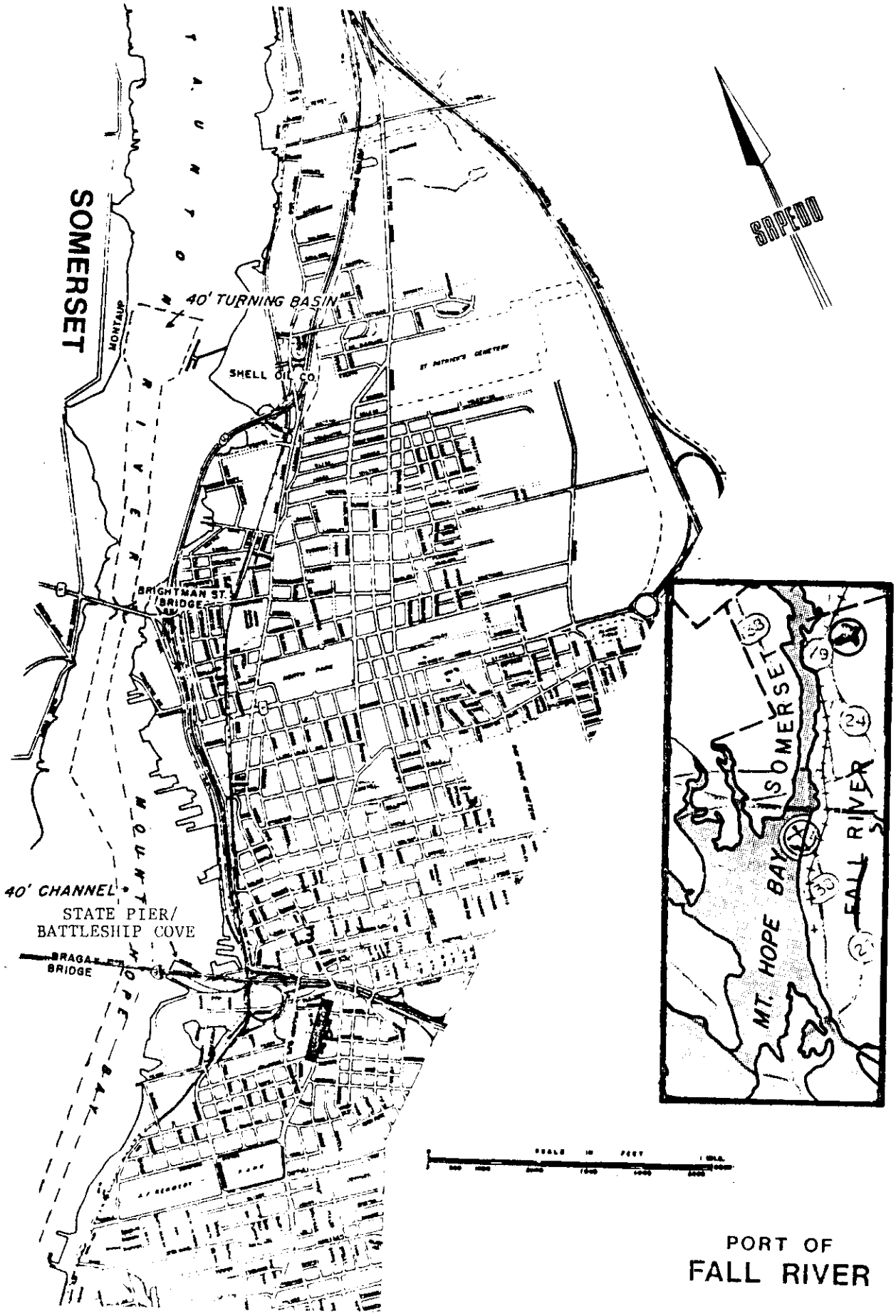
C. Port of Fall River

The harbor at Fall River has a channel 35-feet deep by 400-feet wide. With fifteen marine terminals located in Fall River, Somerset and in Tiverton, Rhode Island, including the 100,000 square foot State Pier, the port is second in size to Boston of all Massachusetts ports and handles over six million tons of cargo annually. Over 3,000 pleasure and commercial vessels call Fall River home port. A map of the harbor is on page 9.

As is the case in New Bedford, most of this incoming cargo are petroleum-related products. Eight of the above fifteen terminals are used for petroleum receipt, some 5,190,000 short tons of which came into Fall River in 1977 (or 98 percent of all cargo that year). Two pipelines for the transport of petroleum run from Fall River to the Boston and Worcester metropolitan areas.

The port of Fall River was outfitted in November, 1979, with a roll on/roll off cargo handling facility at the State Pier, at a cost of well over $300,000 which will allow the port to act as a feeder service between U.S. ports in the northeast and elsewhere, and Canada. Atlantic Ships Management Ltd., a Nova Scotia shipping firm, began operating a 450 foot cargo ship weekly between Argentia, Newfoundland and Fall River during 1980, to transport fish, newsprint, and other cargo from Newfoundland, pipe from Texas, and fruit, meat and produce from New England. Atlantic Ships Management has recently gone out of business, and two other shipping firms are now interested in operating this inter-city route, which takes 2½ days and carries savings over truck transport of from 20 to 30 percent. It may also occur that Fall River will play a role in Newfoundland oil resource development. Utilizing this sea route for transport of other U.S. materials to Canada is now being investigated in hope of attracting other cargo vessels from the Atlantic fleet to dock in Fall River.

During 1980, approval was granted by the EDA for a $3 million Fall River State Pier Modernization Project which would provide additional land at the State Pier for the marshalling, assembly and storage of goods and cargo, and would also involve the reconstruction of the City's sea wall located at the waterfront, to provide for additional docking space for barges and commercial vessels. This project is a result of a Port Development Feasibility Study conducted by the engineering firm of C. E. Maguire in 1976, which gave these two plan components priority status. The State Pier area is also recipient of an active tourist trade focused on Battleship Cove, where the U.S.S. Massachusetts and other military vessels are anchored. Attendance during 1979 alone was nearly 133,000 at the Cove.


SOMERSET
MONTAUP
40' TURNING BASIN
SHELL OIL CO.
BRIGHTMAN ST. BRIDGE
MOUNT HOPE BAY
40' CHANNEL
STATE PIER/
BATTLESHIP COVE
BRAGA BRIDGE
SAPEDO
SOMERSET
MT. HOPE BAY
FALL RIVER
PORT OF
FALL RIVER

Another matter of social and economic importance to Fall River is the needed refurbishing or replacement of the (Route 6) Brightman Street Bridge over the Taunton River which feeds into Mount Hope Bay. The present bridge is now over 70 years of age, and of a height (27 foot clearance at MHW) and width (98 foot clearance at the drawspan) which is inadequate for full marine utilization of the River north of the bridge. Marine traffic there is primarily fuel delivery for Montaup Electric, Shell Oil, and Algonquin SNG Inc. Tankers used are of a width which allows only a 10.5 foot clearance on either side of the vessel. SRPEDD staff conducted a Corridor Planning Study for this bridge and its environs in 1979-1980 and recommended replacement of the present bridge on the same alignment with a multi-lane 35 foot to 50 foot level moveable span with an 150 foot opening. A contract for an EIS for this project has not yet been awarded, and no estimated date for construction has been made at this point.

An ongoing study by the New England River Basins Commission is investigating the economic standing of the port of New York over those ports of the New England region. To New York's credit are rail service rates which favor both New York and Baltimore over New England, and also lower shipping costs and less frequent delays than at New England's ports. Boston, until recently, was the only New England port capable of containerized shipment receipt, which allows unloading of an entire ship within 24 hours rather than a week in "break bulk shipping". Providence now has a containerized cargo facility which they plan to expand, as does Boston in an $11.5 million expansion.

Because New England's bulk industries have left for other areas of the country, very little cargo is shipped out of New England, compared to the volume of goods imported. This is a distinct drawback to New England ports in that major shippers are unwilling to stop at other New England ports than Boston due to the lack of cargo to fill the embarking ship.

To install containerized port facilities elsewhere in New England would require large sums of capital (up to $15,000 per day in operating expenses) and storage areas of from 150 to 200 acres at or near the dock. This is infeasible in the case of New Bedford and Fall River with port facilities so close to the CBD. Also lacking in New England ports, according to the NERBC, are shipping support industries such as freight forwarders, shipping agents and customs brokers. In summary, it is yet more reasonable to ship cargo into New York for truck forwarding to New England on the area's excellent highway system. The ports of New Bedford-Fairhaven and Fall River are readying themselves for the future time period in which fuel prices and trucking rates in turn will be so prohibitively expensive as to make major shipping operations directly in and out of their ports once again economically realistic.

D. Harbor Improvement Dredging and Silt Disposal

Another matter of economic concern to activity at New Bedford and Fall River is the adequate disposal of dredged material following necessary channel dredging. With prior approval of the Environmental Protection Agency, one possibility would be bulkheading and filling at the water's edge of what amounts to hazardous material (due to the high concentrations of PCBs in New Bedford harbor, and mercury, silver and other metals in Fall River harbor). Bulkheading and filling would both offer a solution to the problem of silt disposal, and offer both cities an opportunity to acquire waterfront property for recreational or other uses, with appropriate health hazard precautions. SRPEDD recommended a bulkheading and filling option to the City of Fall River in its 1978 Water Quality Areawide Management Plan for Southeastern Massachusetts (208), and continues its support of this option for both Fall River and New Bedford-Fairhaven harbors.

In February of 1981 the Commonwealth's Executive Office of Energy Resources forwarded letters to members of the U.S. Senate Subcommittee on Energy and Water Development requesting expedition of the harbor dredging project for the Mount Hope Bay channel at Fall River which was authorized by Congress during the 1960's. The EOER has assigned priority attention to the project because of the use and delivery of coal at the Brayton Point Electric Plant, and the coal gasification unit to be built by E.G. and G., Inc. in the same area. A deeper channel would make coal deliveries by water more amenable, and allow Fall River to maintain and develop its position as the major New England coal port.

At present the above project is at the Environmental Impact Statement stage. The projected date of the project's start is mid-1982, and at a complete cost of $38 million (including the removal of the Brightman Street Bridge) will be completed in 1985.

E. Other Regional Seaports

The other SRPEDD seaport towns of Westport, Dartmouth, Swansea, Somerset, Mattapoisett, Marion, and Wareham each enjoy healthy recreational beach, boating and tourist activities, and in most cases, limited commercial fishing activity. The port of Onset in Wareham also offers seasonal tours of the Cape Cod Canal to tourists, as well as sport fishing cruises.

Of concern to these seaports of late has been the buildup in their harbors of bacteria due to illegal discharge of on-boat sanitary facilities. At present only Wareham and Marion now have commercial pumpout facilities for moored pleasure boats. The staff of SRPEDD is now engaged in a Coastal Zone Management Study to address the growing problem caused by the over 6600 permanently moored and hundreds of summer transient vessels

in these seaports. The level of effluent bacteria is high enough in some harbors to seriously effect shellfishing and recreation activities. Current efforts of SRPEDD staff involve assessing where pumpout needs are unmet and where the best locations are for these facilities.

An additional issue of importance to the harbor at Westport is adequate harbor maintenance dredging, as discussed in Section D above, to support the deepwater lobstering activities of about a half dozen commercial fishing vessels which call the harbor home port.

Included in Table I on the following page is an estimate of the numbers of vessels permanently moored at each of the regional seaports, as well as listings of other data pertinent to these seaports.

F. Summary of Issues Affecting SRPEDD Regional Seaports

The Port of New Bedford-Fairhaven:

- The port is considered to be a potential site for Outer Continental Shelf oil drilling support activity. The cargo handling facilities and marine construction and repair capabilities of the port, as well as the vacant parcels of waterfront property suitable for development here, are a natural adjunct to this oil exploration.

- The port is the foremost fishing port on the East Coast in terms of the value of the catch. The port's fleet numbers 180 vessels, and during 1980 these vessels brought 99 million pounds of fish, with a market value of over $71 million, back to port. The port is the world's scallop capital, and its fleet also catches cod, haddock, blueback and yellowtail flounder. On the waterfront are eleven fish handling and processing facilities.

- Unlimited Canadian fish imports act to reduce the market prices of fish caught by the port's fleet, in spite of rising vessel operating costs.

- Of particular importance to the fishing fleet at New Bedford-Fairhaven are controls upon the amount of fish being taken from their fishing grounds in George's Bank by Canadian fishing interests. Following the veto of the U.S.-Canadian Fisheries Treaty which was unduly favorable to Canadian fishermen, assuring fishermen from New Bedford-Fairhaven sufficient access to territory in George's Bank will be a matter to be decided by a separate Boundary-Settlement Treaty pending in the U.S. Senate.

- Fully development of the northern portion of the port's waterfront is contingent upon the replacement of the present Route 6 New Bedford-Fairhaven Bridge with one of a height of 20 feet and a channel horizontal opening of 150 feet clearance. The projected date for construction of the bridge is 1985, at an estimated cost of $22 million.

TABLE I

SRPEDD REGIONAL SEAPORT DATA

COMMUNITY	HARBOR LOCATION(S)	EST. MILES OF SHORELINE	EST. NUMBER OF PERMANENT VESSELS	PREDOMINANT VESSEL TYPE
Dartmouth	Padanaram	33	600-700	Pleasure
Fall River	Mount Hope Bay, Taunton River	9	3,000	Commercial/ Pleasure
Marion	Sippican Harbor	17.5	719-780	Pleasure
Mattapoisett	Mattapoisett Harbor	15.5	300	Pleasure
New Bedford-Fairhaven	Acushnet River	30	N.B. 180-200 Fair. 150	Fishing
Somerset	Taunton River	11.5	90-100	Pleasure
Swansea	Cole River, Lee's River	9.5	100	Pleasure
Wareham	Onset Harbor, Wareham River	57	975	Fishing/ Pleasure
Westport	Westport River	28	400-450	Pleasure
	TOTAL	211	ca. 6625	

- Tests by the Environmental Protection Agency on harbor bottom sediment in 1976 found concentrations of toxic industrial chemical PCB's of from 53 to 56 parts per million, among the highest levels of these chemicals in the United States. As a result of these tests, the Massachusetts Department of Public Health has banned fishing and lobstering from South Dartmouth to Fairhaven, including the New Bedford-Fairhaven inner harbor. The Massachusetts Water Resources Commission has approved a $35,000 grant to study cleanup methods in the harbor.

The Port of Fall River:

- The port is second in size only Boston in Massachusetts. Having 15 marine terminals in Fall River, Somerset and in Tiverton, Rhode Island, the port handles over six million tons of cargo yearly (much of it petroleum-related).

- Over 3,000 pleasure and commercial vessels call the port of Fall River home port.

- The port was outfitted in late 1979 with a roll on/roll off cargo handling facility at the State Pier, which will allow the port to act as a feeder between northeast U.S. ports and Canada.

- During 1980 the Economic Development Administration granted approval for a $3 million Fall River State Pier Modernization Project, which is to include acquisition of land at the State Pier for marshalling, assembly and storage of goods and cargo, and also to include the reconstruction of the port's sea wall for additional docking space for barges and commercial vessels.

- The State Pier is the site of Battleship Cove, where the U.S.S. Massachusetts and other military vessels are anchored.

- Of social and economic importance to the port is the refurbishing or replacement of the Brightman Street Bridge over the Taunton River. The present bridge is now over 70 years of age, and of a height and width sufficient for full maritime use of the River north of the bridge.

Harbor Improvement Dredging:

- Adequate disposal of dredged material following channel dredging is of concern to both New Bedford-Fairhaven and Fall River due to the concentrations of PCB's in New Bedford-Fairhaven silt, and mercury, silver and other metals in Fall River silt. Bulkheading and filling of this silt could offer both ports the opportunity for acquiring waterfront property for recreational or other uses.

- Expedition of the dredging project for the Mount Hope Bay channel at Fall River has been given priority attention by the Commonwealth's Executive Office of Energy Resources, to allow for more adequate channel use for coal delivery to Brayton Point and the proposed E.G. and G. coal gasification unit, and to allow the port to maintain and develop its position as the premiere New England coal port.

Other Regional Seaports:

- The buildup of bacteria in the harbors of regional seaports, due to illegal discharge of on-board sanitary facilities, is of particular concern at present. The SRPEDD staff is engaged in a Coastal Zone Management Study to address this problem caused by the over 6,000 permanently moored boats, and hundreds of transient vessels. Efforts involve assessing where boat sanitary pumpout needs are unmet, and where the best locations are for these facilities.

- Of importance to Westport harbor is adequate harbor maintenance dredging in support of lobstering activities by the small fleet of commercial vessels there.

SERPA

208

WATER QUALITY

AREAWIDE MANAGEMENT PLAN

FOR

SOUTHEASTERN MASSACHUSETTS

FINAL RECOMMENDATIONS

AND

ENVIRONMENTAL IMPACT STATEMENT

FEBRUARY, 1978

PREPARED BY:

SOUTHEASTERN REGIONAL PLANNING AND
ECONOMIC DEVELOPMENT DISTRICT
MARION, MASSACHUSETTS 02738

US ENVIRONMENTAL PROTECTION AGENCY
REGION I
JFK FEDERAL BUILDING
BOSTON, MASSACHUSETTS 02203

William R. Adams
Regional Administrator
EPA - Region I

Julia Enroth
Chairman, SRPEDD

This plan was prepared with a grant from the Environmental Protection Agency in accordance with Section 208 of the Federal Water Pollution Control Act, Amendments of 1972 (PL 92-500).

The cause is probably salt spray and windborne transport of road salt from the highways. The Water Department should monitor the levels of chlorides and if necessary negotiate a memorandum of understanding with the state DPW regarding application rates of road salt.

4. Sludge and Septage

Fall River will be incinerating its sludge in accordance with the 201 study. The City will accept septage from Freetown, Westport, Tiverton, and other communities up to 90,000 gallons per day.

5. Industry

Fall River appears to be making an excellent effort to avoid problems encountered in other municipalities of communication gaps between industry and the City in the user charge, industrial cost recovery, and pretreatment requirements of the treatment plant development. The City's newsletter to industrialists is an excellent example of coordination.

6. Non-Point Sources

a. Runoff of anti-fouling bottom paint from boat washing operations should be controlled through diversion of direct runoff into detention basins or permeable areas.

b. Harbor Sediment

Proposals to deepen the channel to Fall River have stalled due to the controversy over the proposed ocean dumping of the dredged material. It is recommended that sediment from the Bay be deposited in bulk-headed land disposal sites adjacent to the water bodies from which they are removed. This will allow any leaching to return to a contaminated area rather than introducing this material, which contains metals and other pollutants, to a new land or ocean environment.

AGENDA

FALL RIVER HARBOR NAVIGATION IMPROVEMENT PROJECT

PUBLIC WORKSHOPS, FALL RIVER, MA, JULY 14, 1981
AND JAMESTOWN, RI, JULY 15, 1981

I. Introduction

A. The Workshop Process and Public Involvement
(See Information Packet p. 1)

B. Suggested Workshop Procedures

1. Questions/Comments/Responses
2. Time Limits
3. Audience Participation
4. Media Coverage

C. The Participants

1. BEC, Inc.
2. The Panelists/Public
   a. Introductions/Affiliation
   b. Sign In Sheet/Mailing List

D. Roles of Workshop Consultants/Agency

1. Facilitator
2. Recorder
3. Fact Persons

II. The Proposed Action

A. Project Description
(See Information Packet p. 2 & Fig. 1)

1. Authorized Project Limits
2. Proposed Action

B. Characteristics of Dredged Materials
(See Information Packet Sect. IV)

1. Summary of Findings to Date
2. Panelist/Public Input

C. Dredged Material Disposal Options

1. Upland (See Information Packet p. 3)
   a. Review NERBC & COE Screening Process
   b. Site "27" (Montaup Electric)
   c. Other Sites by Panelists/Public
      1. Existing Conditions/Volume
      2. Environmental Effects
      3. Alternatives

2. Shallow Water (See Information Packet p. 3)
   a. Spar Island
      1. Structural Containment
      2. Limited Containment
   b. EG & G
   c. Brayton Point (NEPCO)
   d. Other Sites by Panelists/Public
      1. Existing Conditions/Volume
      2. Environmental Effects
      3. Alternatives
3. Open Water Sites
   (See Information Packet p. 4-8 & Fig. 2)
   a. Review COE Delineated Sites
   b. Other Sites by Panelists/Public
      1. Existing Conditions/Haul Distance
      2. Environmental Effects
      3. Alternatives

III. Summary - Public Consensus

A. Upland Sites

1. Existing Conditions/Volume/Distance
2. Potential Environmental Effects
3. Alternatives

B. Shallow Water Sites

1 - 3 As Above

C. Open Water Sites

1 - 3 As Above

IV. Workshop Closing

A. Summary Statement

B. "Where Do We Go From Here?"

C. Written Submission - Due By July 31, 1981